

بسم الله الرحمن الرحيم









شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم





جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة يعيدا عن الغيار





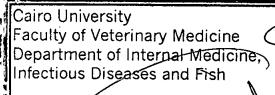






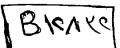
بالرسالة صفحات لم ترد بالأصل





Some studies on subclinical

mastitis in cattle and buffaloes



Thesis presented by

Walid Sayed Ahmed Abd El-Kader Awad

B. V. Sc. Cairo University, 1991 M. V. Sc. Cairo University, 1995

For the degree of Ph. D. (Infectious Diseases)

Under supervision of

Prof. Dr. Abd Ei - Monem Ahmed Salem

Prof. of Infectious Diseases
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Samia Abd El - Hamid Ahmed

Prof. of Infectious Diseases Faculty of Veterinary Medicine Cairo University

9

Cairo University
Faculty of Veterinary Medicine
Department of Internal Medicine,
Infectious Diseases and Fish

APPROVAL SHEET

This is to approve that the dissertation presented by:

Mr. Walid Sayed Ahmed Abd El-Kader Awad

To Cairo University entitled:

Some studies on subclinical mastitis in cattle and buffaloes

For the degree of Ph.D. (Infectious Diseases)
Has been approved by the examining committee:

Prof. Dr. Metwally Mohamed El-Shinnawy

Prof. of Infectious Diseases
Faculty of Veterinary Medicine
Alexandria University

Elemente.

Prof. Dr. Mahmoud Mohamed Amin

Prof. of Infectious Diseases
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Samia Abd El-Hamid Ahmed (Supervisor)

Prof. of Infectious Diseases
Faculty of Veterinary Medicine
Cairo University

Sami

DATE: 24 / 6/ 1999

DEDICATED TO

MY PARENTS WHO
I AM NOTHING WITHOUT THEM

MY DEAR FATHER

AND

MY KIND MOTHER

AND TO MY DEAR PROFESSORS

Prof. Dr. Samia Abd El-Hamid and Prof. Dr. Abd El-Monem Salem

ACKNOWLEDGMENT

From the bottom of my heart, I wish to express my deepest thanks and sincere gratitude to

My dear professor/Prof. Dr. Abd El-Monem Ahmed Salem, professor of infectious diseases, Fac. of Vet. Med.-Cairo Univ., for his supervision, planning, encouragement and kindness with me.

My dear Professor/Prof. Dr. Samia Abd El-Hamid Ahmed, professor of infectious diseases, Fac. of Vet. Med.-Cairo Univ., for her supervision, guidance, continuous encouragement, advising and generous support offered to me all over the whole work.

My dear Professor/Prof. Dr. Mahmoud Mohamed Amin, professor of infectious diseases, Fac. of Vet. Med.-Cairo Univ., for his valuable guidance, advising, great helping and supporting during the completion of this work.

My dear Professors/Prof. Dr. Adel Abd El-Azim Fayed, Prof. Dr. Hasan El-Saeed and Prof. Dr. Monier Mohamed Abd El-Halim, professors of infectious diseases, Fac. of Vet. Med.-Cairo Univ., for their great advises, sincere helping and great cooperation.

My dearest brother/ Dr. Taher Ahmad Baraka, assistance lecturer of internal medicine for his great helping and assistance offered to me.

My dearest sister/ Dr. Nadra El-Wogood Mohamed, assistance lecturer of infectious diseases for her sincere and generous helping during the completion of this work.

Dr. Hamed Mamoud Hammam, deputy director of the central laboratory for quality control on veterinary products and Dr. Hosam Fawzy, general veterinary services for their great advises, guidance and valuable helping during statistical analysis.

Prof. Dr. Raouf Rizk, professor of infectious diseases, Fac. of Vet. Med. Cairo Univ., Dr. Magdy Mahomed El-Sayed and Dr. Tarek Ismail assistance professors of infectious diseases, Fac. of Vet. Med. Cairo Univ. for their great cooperation and offering me some materials used in this study.

My dear colleagues Dr. Yohana Sobhy, assistance lecturer of bacteriology, Fac. of Vet. Med.-Cairo Univ. and Dr. Mohamed Mohyee, demonstrator of internal medicine, Fac. of Vet. Med.-Cairo Univ. and my dear brother Ashraf El-Sayed, lecturer of physics, Fac. of Education-Ain Shams University for their great supporting and sincere helping.

CONTENTS

| I-INTRODUCTION | |
|--|--|
| II- LITERATURE | |
| A-Prevalence of subclinical mastitis in cows and buffaloes | |
| B-Bacteriological examination | |
| C-Screening tests for prediction of bacteriological status of milk samples | |
| 1-Somatic cell count | |
| 2-Milk N-acetyl-beta-D-gluocsaminidase activity | |
| 3-Electrical conductivity | |
| 4-California Mastitis Test | |
| D-Antibiotic sensitivity and beta lactamase production | |
| 1-Antibiotic sensitivity | |
| 2- Beta lactamase production by isolated bacteria. | |
| E-Field treatment. | |
| | |
| III-MATERIALS AND METHODS | |
| A-MATERIALS | |
| B-METHODS | |
| | |
| IV-EXPERIMENTS AND RESULTS | |
| EXPERIMENT-1: | |
| Prevalence of subclinical mastitis in cows and buffaloes | |
| EXPERIMENT-2: | |
| Screening (diagnostic) tests for prediction of bacteriological status | |
| of milk samples | |
| A-Measurement of milk N-acetyl-beta-D-gluocsaminidase activity | |
| B-Measuring of milk electrical conductivity in cows | |
| C-Examination of milk by using California Mastitis Test | |
| D-Statistical analysis and evaluation of screening tests | |
| EXPERIMENT-3: | |
| Testing of antibiotic sensitivity and beta lactamase production. | |
| A-Antibiotic sensitivity testing | |
| B-Testing of beta lactamase production. | |
| EXPERIMENT-4: | |
| Field trial for treatment of infected quarters | |
| V-DISCUSSION | |
| | |
| VI-SUMMARY | |
| VII-REFERENCES | |
| VIII-ARABIC SUMMARY | |
| □ で から □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ | |

LIST OF TABLES

| Table no. | Title | Page no. |
|-----------|---|----------|
| 1 | Number of examined animals, animal species, type of milking,, number of examined quarters, number of quarters with abnormal milk and number of abnormal quarters. | |
| 2 | Antibiotic sensitivity discs. | 102 |
| 3 | The main differentiating characteristics of the Gram-positive cocci. | 112 |
| 4 | Differential characteristics of important Staphylococci. | 113 |
| 5 | Differential characteristics of important Streptococci. | 114 |
| 6 | Differential characteristics of selected Gram negative rods. | 114 |
| 7 | Differential characteristics of selected Coryneform bacteria. | 115 |
| 8 | Differential characteristics of selected Bacillus species. | 115 |
| 9 | The working factor (WF) used for direct micoscopical somatic cell count. | 122 |
| 10 | The grading of the California mastitis test. | 125 |
| 11 | Zone diameter interpretive standards of the used antibiotic discs. | 127 |
| 12 | International Dairy Federation Scheme. | 139 |
| 13 | Bacteriological examination of apparently normal quarter foremilk samples collected from apparently normal udders of cows and buffaloes. | 142 |
| 14 | Distribution of infection according to the number of quarters infected per animal. | 145 |
| 15 | Sites of infected quarters in relation to the bacteriological examination. | 147 |
| 16 | Effect of lactation number, stage of lactation and age on infection in machine milking cows: | 149 |
| 17 | Types of the isolated microorganisms from infected quarters (samples) of cows. | 153 |
| 18 | Types of the isolated microorganisms from infected quarters (samples) of buffaloes. | 154 |

| -, | | |
|---------------|---|-----|
| 19 | Descriptive statistics of direct microscopical somatic cell count of apparently normal quarter foremilk samples with different bacteriological status in cows and buffaloes. | 156 |
| 20 | Different cutoff values and the selected threshold of <i>SCC</i> in cows with their specificity, sensitivity, false positive rate, false negative rate, true prevalence, apparent prevalence, predictive value positive, predictive value negative and accuracy. | 158 |
| 21 | Different cutoff values and the selected threshold of <i>SCC</i> in buffaloes with their specificity, sensitivity, false positive rate, false negative rate, true prevalence, apparent prevalence, predictive value positive, predictive value negative and accuracy. | 158 |
| 22 | Prevalence of subclinical mastitis in cows and buffaloes. | 162 |
| 23 | Distribution of subclinical mastitis according to the number of quarters infected per animal. | 165 |
| 24 | Sites of subclinically mastitic quarters. | 167 |
| 25 | Effect of lactation number, stage of lactation and age on prevalence of subclinical mastitis in machine milking cows. | 169 |
| 26 | Types of the isolated microorganisms from subclinically infected quarters (samples) of cows. | 173 |
| 27 | Types of the isolated microorganisms from subclinically infected quarters (samples) of buffaloes. | 174 |
| 28 | Descriptive statistics of direct microscopical somatic cell count of normal and subclinically infected quarter foremilk samples with different bacteriological status collected from cows and buffaloes. | 175 |
| 29 | Descriptive statistics of <i>NAGase</i> activity (expressed as optical density) of apparently normal quarter foremilk samples collected from cows and buffaloes with different bacteriological status. | 178 |
| 30 | Descriptive statistics of <i>NAGase</i> activity (nmole/min/ml) of apparently normal quarter foremilk samples collected from cows and buffaloes with different bacteriological status. | 179 |
| 31 | Descriptive statistics of <i>NAGase</i> activity (expressed as optical density) of subclinically infected quarter foremilk samples collected from cows and buffaloes with different bacteriological status. | 180 |

| 32 | Descriptive statistics of <i>NAGase</i> activity (nmole/min/ml) of normal and subclinically infected quarter foremilk samples collected from cows and buffaloes with different bacteriological status. | 181 |
|---------------|---|-----|
| 33 | Different cutoff values and the selected threshold of <i>NAGase</i> activity in cows with their specificity, sensitivity, false positive rate, false negative rate, true prevalence, apparent prevalence, predictive value positive, predictive value negative and accuracy. | İ |
| 34 | Different cutoff values and the selected threshold of <i>NAGase</i> activity in buffaloes with their specificity, sensitivity, false positive rate, false negative rate, true prevalence, apparent prevalence, predictive value positive, predictive value negative and accuracy. | 183 |
| 35 | Descriptive statistics of <i>EC</i> of apparently normal quarter foremilk samples collected from cows with different bacteriological status. | 186 |
| 36 | Descriptive statistics of <i>EC</i> of normal and subclinically mastitic quarter foremilk samples collected from cows with different bacteriological status. | 188 |
| 37 | Different cutoff values and the selected threshold of absolute <i>EC</i> in cows with their specificity, sensitivity, false positive rate, false negative rate, true prevalence, apparent prevalence, predictive value positive, predictive value negative and accuracy. | 191 |
| 38 | Different cutoff values and the selected threshold of differential <i>EC</i> in cows with their specificity, sensitivity, false positive rate, false negative rate, true prevalence, apparent prevalence, predictive value positive, predictive value negative and accuracy. | 191 |
| 39 | California mastitis test reaction in cows and buffaloes. | 194 |
| 40 | California mastitis test scores of apparently normal quarter foremilk samples collected from cows and buffaloes. | 196 |
| 41 | Bacteriological examination of quarter foremilk samples collected from cows and buffaloes showing different <i>CMT</i> scores. | 198 |
| 42 | Evaluation of California Mastitis Test in cows and buffaloes. | 200 |
| 43 | Correlation coefficient (r) between different screening tests used for examination of apparently normal quarter foremilk samples collected from cows. | 202 |
| 44 | Correlation coefficient (r) between different screening tests used for examination of apparently normal quarter foremilk samples collected from buffaloes. | 203 |
| - | | |